UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

October 1, 1999

MEMORANDUM:

SUBJECT: Methamidophos. List A Reregistration Case 0043. Chemical No. 101201. Revised Product and Residue Chemistry Chapters for the Reregistration Eligibility Decision. DP Barcode: D259664.

FROM: Felecia A. Fort, Chemist
Reregistration Branch 1
Health Effects Division (7509C)

THRU: Whang Phang, Branch Senior Scientist
Reregistration Branch 1
Health Effects Division (7509C)

TO: Kimberly Lowe, Chemical Review Manager
Special Review Branch
Special Review and Reregistration Division (7508W)

Attached are the Revised Product and Residue Chemistry Chapters for the Methamidophos Reregistration Eligibility Document (RED). This chapter supercedes the previous product and residue chemistry RED chapter completed 10/30/98 (F. Fort, D237788) . The chapter was revised to incorporate (i) residue data from a potato processing study submitted by the registrant Bayer, Inc.; (ii) revised anticipated residue information ; and (iii) information concerning a import tolerance petition (PP#9E5040) submitted.

Product Chemistry

Pertinent data requirements have not been satisfied for the Bayer 72% T (EPA Reg. No. 3125-341) and the Valent 72% T (EPA Reg. No. 59630-68). For the Bayer 72% T additional data are required for OPPTS 830.1550, 830.1600-1650, 830.1750, 830.1800, 830.6313-830.6320, 830.7000, 830.7050, and 830.7100. For the Valent 72% T additional data are required for OPPTS 830.1600-1650, 830.1700, 830.1750, 830.1800, 830.6314, 830.6316, 830.6317, 830.7000, 830.7050, 830.7200, 830.7370, and 830.7550-830.7570. All MP data requirements are outstanding for the Bayer 60% FI (EPA Reg. No. 3125-348). Provided that the registrants submit the data required in the attached data summary tables for the 72% Ts and 60% FI, and either

certify that the suppliers of beginning materials and the manufacturing processes for the methamidophos MPs have not changed since the last comprehensive product chemistry review or submit complete updated product chemistry data packages, HED has no objections to the reregistration of methamidophos with respect to product chemistry data requirements.

Residue Chemistry

Tolerances have been established for residues of methamidophos in/on various raw agricultural commodities [40 CFR §180.315(a) and (b)]. In addition, tolerances have been established for combined residues of acephate and its metabolite methamidophos in/on various plant and animal commodities [40 CFR §180.108(a) and (b)]. Tolerances established for acephate in/on several commodities (beans, Brussels sprouts, cauliflower, celery, cranberries, lettuce, mint hay, and peppers) include limits on residues of methamidophos.

EPA issued a notice of termination of the use of methamidophos on all crops except tomatoes, cotton, and potatoes by deleting uses from all methamidophos FIFRA Section 3 registrations, and cancellation of all methamidophos 24(c) food-use registrations not labeled for use on tomatoes only. The notice was published in the Federal Register on 12/23/97 (62 FR 67071-67072). A list of FIFRA Section 3 registrations to be amended to terminate methamidophos uses based on a request from Bayer and Valent includes the use of methamidophos on broccoli, Brussels sprouts, cabbage, cauliflower, celery, and sugar beets. The registrant recently submitted an import tolerance petition for peppers, strawberries, and squash (PP#9E5040). This petition has not been reviewed. There is an existing tolerance for methamidophos on peppers, but none has been established for the latter two commodities. Peppers, strawberries, and squash have been included in the revised dietary exposure analyses.

Methamidophos is also a metabolite of acephate. It has previously been recommended that residues of methamidophos resulting from the metabolism of acephate be included under the tolerance regulations for methamidophos as a pesticide [40 CFR §180.315(c)]. This change is needed to achieve compatibility with the MRLs of the Codex Alimentarius Commission, if only in terms of residue definition. Such a change in the residue definition would require deletion of paragraph (d) (8) of 40 CFR §180.3 which states that methamidophos residues may not exceed the higher of the two tolerances established for the use of acephate or methamidophos as a pesticide.

Additionally, the registrant is advised to add a statement to the label which states that no methamidophos products should be applied after application of acephate since this may result in illegal residues.

The registrants must modify all product labels with uses on cotton, potatoes, and tomatoes to specify a maximum seasonal rate and/or maximum number of applications per season. These label modifications should be supported by adequate field residue data.

One SLN registration for use of methamidophos on tomatoes specifies different use directions for tomatoes destined to be processed. The Agency does not believe that such a restriction is practical, and therefore, this restriction must be removed from the label. Additionally, the cotton labels contain grazing/feeding restrictions which the Agency also considers to impractical and must be removed.

The chemistry database is essentially complete. Based on the available plant metabolism data, the methamidophos residue of concern in plant commodities is the parent, methamidophos. Acceptable goat and hen metabolism studies have been submitted and evaluated. The livestock metabolism data indicate that no detectable residues of concern are likely to be present in eggs, milk, and livestock tissues. With regard to livestock, a 40 CFR 180.6(a)(3) [Category 3] situation exists. Therefore, no tolerances on animal commodities are required.

Adequate methods are available for the enforcement of established tolerances. The Pesticide Analytical Manual (PAM) Volume II lists Method I, a GLC method employing thermionic detection, as well as Method A, a confirmatory TLC method. Codex MRLs have been established for residues of methamidophos per se

Pending label amendments for some crops, adequate field trial data are available to reassess the established tolerances for cottonseed, potatoes, and tomatoes. The available data suggest that the tolerance levels for cottonseed and tomato should be raised to 0.2 ppm and 2.0 ppm, respectively. A tolerance for residues of methamidophos in/on cotton gin byproducts must be proposed. The available data support a tolerance level of 10 ppm.

The registrants are not supporting use of methamidophos on Brussels sprouts, cauliflower, celery, and lettuce. Because there are registered acephate uses on these crops, methamidophos tolerances for these crops should be moved to 40 CFR §180.315(c). Additionally, the basic producer of acephate (Valent U.S.A. Corporation) has indicated that they will be supporting use of acephate on the following food/feed crops which were not originally on the methamidophos labels: beans (snap, dry, and lima); cranberries; and peppermint/spearmint. Therefore, tolerances for residues of methamidophos in/on these commodities resulting from use of acephate should also be established under 40 CFR §180.315(c). The tolerance expression in this section should read: "Tolerances are established for residues of methamidophos in or on the following raw agricultural commodities as a result of the application of acephate:".

The tolerances in/on the following commodities should be revoked as the registrants are not supporting methamidophos uses and there are no registered acephate uses on source crops: beets, sugar, roots; beets, sugar, tops; broccoli; cabbage; cucumbers; eggplant; and melons.

Provided that the registrants establish a 150-day plantback interval for all crops, the reregistration requirements for confined rotational crops are fulfilled. If the registrants desire a shorter plantback interval, then additional characterization data for the available confined rotational crop study must be submitted. Field rotational crop studies may be required if the registrants desire plantback intervals shorter than 150 days. Currently, there are no plantback intervals listed on product labels.

cc: Reviewer(F. Fort), Reg. Std. File, RF, SF, Circ.
RDI: ExpoTeam /98: ChemSac: WPhang:
7509C:RRB1:CM#2:Rm732B:305-7478:FAFort/FF:
Disk8:methamid.red

METHAMIDOPHOS

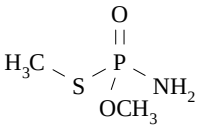
REREGISTRATION ELIGIBILITY DECISION:

PRODUCT CHEMISTRY CONSIDERATIONS

PC Code 101201; Case No. 0043

DESCRIPTION OF CHEMICAL

Methamidophos (O,S-dimethyl phosphoramidothioate) is an acaricide/insecticide registered for use on cotton and potatoes. We note that the registered uses of methamidophos on broccoli, Brussels sprouts, cabbage, cauliflower, celery, and sugar beets are to be canceled, and the 24(c) registrations labeled for melons, cucumbers, lettuce, alfalfa, Bermuda grass, peppers, clover, and eggplant are pending cancellation, leaving tomatoes as the only remaining food use with methamidophos 24(c) registrations.



Empirical Formula:	$C_2H_8NO_2PS$
Molecular Weight:	141.1
CAS Registry No.:	10265-92-6
PC Code:	101201

IDENTIFICATION OF ACTIVE INGREDIENT

Methamidophos is a colorless to white crystalline solid with a strong mercaptan-like odor and a melting point of 46.1 C. Methamidophos is readily soluble (>200 g/L) in water, acetone, dimethylformamide, dichloromethane, and 2-propanol, and is soluble in n-octanol at 50-100 g/L, toluene at 2-5 g/L, and n-hexane at <1 g/L.

MANUFACTURING-USE PRODUCTS

A search of the Reference Files System (REFS) conducted 12/05/97 identified three methamidophos manufacturing-use products (MPs) registered under PC Code 101201: the Bayer Corporation 72% technical product and 60% formulation intermediate (T and FI; EPA Reg. Nos. 3125-341 and 3125-348, respectively), and the Valent U.S.A. Corporation 72% T (EPA Reg. No. 59639-68). We note that the Valent 72% T was transferred from Chevron (EPA Reg. No. 62499-21; 10/4/91). Only the registered 72% Ts and 60% FI are subject to a reregistration eligibility decision.

REGULATORY BACKGROUND

Additional generic and product-specific product chemistry data for methamidophos were required in the Methamidophos Reregistration Standard Guidance Document issued 9/30/82. At that time the Chevron product was produced by Mobay Corp. The current status of the product chemistry data requirements for the methamidophos 72% Ts and 60% FI is presented in the attached data summary tables. Refer to these tables for a listing of the outstanding product chemistry data requirements.

CONCLUSIONS

Pertinent data requirements have not been satisfied for the Bayer 72% T (EPA Reg. No. 3125-341) and the Valent 72% T (EPA Reg. No. 59630-68). For the Bayer 72% T additional data are required for OPPTS 830.1550, 830.1600-1650, 830.1750, 830.1800, 830.6313-830.6320, 830.7000, 830.7050, and 830.7100. For the Valent 72% T additional data are required for OPPTS 830.1600-1650, 830.1700, 830.1750, 830.1800, 830.6314, 830.6316, 830.6317, 830.7000, 830.7050, 830.7200, 830.7370, and 830.7550-830.7570. All MP data requirements are outstanding for the Bayer 60% FI (EPA Reg. No. 3125-348). Provided that the registrants submit the data required in the attached data summary tables for the 72% Ts and 60% FI, and either certify that the suppliers of beginning materials and the manufacturing processes for the methamidophos MPs have not changed since the last comprehensive product chemistry review or submit complete updated product chemistry data packages, HED has no objections to the re registration of methamidophos with respect to product chemistry data requirements.

AGENCY MEMORANDA CITED IN THIS DOCUMENT

CBRS No(s).: 15965, 15966, 15967
DP Barcode(s): D217971, D217973, D217974
Subject: Methamidophos Reregistration. Bayer 5/25/95 Submission [GLNs 61 Series, 62-1, 62-2, 63-2 - -11 Data, & a CSF for the Technical; 3125-341] in Response to the 7/94 DCI & a 3/8/95 Agency Letter.
From: K. Dockter
To: R. Dumas/M. Spann
Dated: 12/27/95
MRID(s): 43661001-43661003

PRODUCT CHEMISTRY CITATIONS

Bibliographic citations include only MRIDs containing data which fulfill data requirements.

References (cited):

00014021 Chevron Chemical Company (1970) Monitor Insecticide Residue Tolerance Petition: Physical and Chemical Properties. (Unpublished study received Mar 5, 1970 under 0F0956; CDL:093266-M)

00014023 Hayman, E.L. (1969) Monitor by Gas Chromatography. Method dated Oct 16, 1969. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL: 093266-Q)

00014024 Chevron Chemical Company (19??) Monitor Insecticide Residue Tolerance Petition: Manufacturing Process. (Unpublished study received Mar 5, 1970 under 0F0956; CDL:093266-R)

00014025 Leary, J.B. (1969) Determination of Monitor Insecticide and the Thiono Isomer Impurity in Technical Monitor Insecticide. Method dated Apr 23, 1969. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093266-S)

00014026 Leary, J.B. (1968) Determination of N,O,S-Trimethyl phosphoramidothioate in Monitor Insecticide. Method dated Jun 13, 1968. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL: 093266-T)

00014027 Leary, J.B. (1968) Determination of N,O,O-Trimethyl phosphoramidothioate in Monitor Insecticide. Method dated Jun 13, 1968. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL: 093266-U)

00014028 Leary, J.B. (1969) Determination of O,S-Dimethyl phosphorothioate in Monitor Insecticide. Method dated Dec 12, 1969. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093266-V)

00014029 Leary, J.B. (1968) Determination of Dimethyl sulfate in Monitor Insecticide. Method dated Jun 13, 1968. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093266-W)

00014030 Leary, J.B. (1970) Determination of Methyl sulfuric acid in Monitor Insecticide. Method dated Jan 21, 1970. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093266-X)

00014032 Leary, J.B. (1968) Determination of N,N,O,S-Tetramethyl phosphoramidothioate in Monitor Insecticide. Method dated Jun 13, 1968. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093266-Z)

00014033 Leary, J.B. (1968) Determination of N,N,O,O-Tetramethyl phosphoramidothioate in Monitor Insecticide. Method dated Jun 13, 1968. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093266-AA)

00014037 Chevron Chemical Company (19??) Monitor Insecticide Residue Tolerance Petition: Name and Chemical Identity. (Unpublished study received Mar 5, 1970 under 0F0956; CDL:093266-AF)

43661001 Fontaine, L. (1995) Product Chemistry of Monitor Technical: Lab Project Number: PEN0366: ANR-00195: BR 1890. Unpublished study prepared by Bayer Corp. 80 p.

43661002 Fontaine, L. (1995) Product Chemistry of Monitor Technical: Lab Project Number: 106538: 106724: BR 1891. Unpublished study prepared by Bayer Corp. 127 p.

43661003 Fontaine, L. (1995) Product Chemistry of Monitor Technical: Lab Project Number: 87273: 94652: 94653. Unpublished study prepared by Bayer Corp. 39 p.

Case No. 0043
Chemical No. 101201

Case Name: Methamidophos
Registrant: Bayer Corporation
Product(s): 72% T (EPA Reg. No. 3125-341)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [1]	MRID Number [2]
830.1550	Product Identity and Disclosure of Ingredients	N [3]	43661001
830.1600 830.1620 830.1650	Starting Materials and Manufacturing Process	N [4]	43661001
830.1670	Discussion of Formation of Impurities	Y	43661001
830.1700	Preliminary Analysis	Y	43661002
830.1750	Certification of Ingredient Limits	N [3]	43661002
830.1800	Analytical Methods to Verify the Certified Limits	N [5]	43661001
830.6302	Color	Y	43661001, 43661003
830.6303	Physical State	Y	43661001, 43661003
830.6304	Odor	Y	43661001, 43661003
830.6313	Stability	N	
830.6314	Oxidation/Reduction	N	
830.6315	Flammability	N	
830.6316	Explodability	N	
830.6317	Storage Stability	N	
830.6319	Miscibility	N	
830.6320	Corrosion Characteristics	N	
830.7000	pH	N	
830.7050	UV/Visible Absorption	N [6]	
830.7100	Viscosity	N	
830.7200	Melting Point/Melting Range	Y	43661001
830.7220	Boiling Point/Boiling Range	Y	43661001, 43661003
830.7300	Density/Relative Density/Bulk Density	Y	43661001, 43661003
830.7370	Dissociation Constant in Water	Y	43661003
830.7550 830.7560 830.7570	Partition Coefficient (Octanol/Water)	Y	43661003
830.7840 830.7860	Solubility	Y	43661001, 43661003
830.7950	Vapor Pressure	Y	43661001, 43661003

[1] Y = Yes; N = No; N/A = Not Applicable.

[2] All references were reviewed under CBRS Nos. 15965-15967, D217971, D217973, and D217974, 12/27/95, K. Dockter.

[3] A revised CSF must be submitted including upper certified limits for several impurities designated in the CBRS memorandum.

[4] The following additional information are required: (i) the relative amounts of the starting materials; (ii) a description of any purification

procedures, including procedures to recover or recycle starting materials, intermediates, or the final product; (iii) a description of the measures taken to assure the quality of the final product including procedures involving the equipment used for blending product components and for filling and packaging; (iv) a flow chart with chemical equations of each intended chemical reaction occurring at each step of the process; and (v) the duration of each step of the process.

[5] A nonconfidential method must be submitted for the active ingredient, and an enforcement method with supporting validation data must be submitted for each impurity for which an upper certified limit is required.

[6] The OPPTS Series 830, Product Properties Test Guidelines require data pertaining to UV/visible absorption for the PAI.

Case No. 0043
Chemical No. 101201

Case Name: Methamidophos
Registrant: Bayer Corporation
Product(s): 60% FI (EPA Reg. No. 3125-348)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [1]	MRID Number
830.1550	Product Identity and Disclosure of Ingredients	N	
830.1600 830.1620 830.1650	Starting Materials and Manufacturing Process	N	
830.1670	Discussion of Formation of Impurities	N	
830.1700	Preliminary Analysis	N/A [2]	
830.1750	Certification of Ingredient Limits	N	
830.1800	Analytical Methods to Verify the Certified Limits	N	
830.6302	Color	N	
830.6303	Physical State	N	
830.6304	Odor	N	
830.6313	Stability	N/A [2]	
830.6314	Oxidation/Reduction	N	
830.6315	Flammability	N	
830.6316	Explodability	N	
830.6317	Storage Stability	N	
830.6319	Miscibility	N	
830.6320	Corrosion Characteristics	N	
830.7000	pH	N	
830.7050	UV/Visible Absorption	N/A [2]	
830.7100	Viscosity	N	
830.7200	Melting Point/Melting Range	N/A [2]	
830.7220	Boiling Point/Boiling Range	N/A [2]	
830.7300	Density/Relative Density/Bulk Density	N	
830.7370	Dissociation Constant in Water	N/A [2]	
830.7550 830.7560 830.7570	Partition Coefficient (Octanol/Water)	N/A [2]	
830.7840 830.7860	Solubility	N/A [2]	
830.7950	Vapor Pressure	N/A [2]	

[1] Y = Yes; N = No; N/A = Not Applicable.

[2] TGAI data requirements will be fulfilled by data for the technical source product.

Case No. 0043
Chemical No. 101201

Case Name: Methamidophos
Registrant: Valent Corporation
Product(s): 72% T (EPA Reg. No. 59639-68)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [1]	MRID Number [2]
830.1550	Product Identity and Disclosure of Ingredients	Y	00014037
830.1600 830.1620 830.1650	Starting Materials and Manufacturing Process	N [3]	00014024
830.1670	Discussion of Formation of Impurities	Y	00014024
830.1700	Preliminary Analysis	N	00014024
830.1750	Certification of Ingredient Limits	N	00014024
830.1800	Analytical Methods to Verify the Certified Limits	N [4]	00014023, 00014025-00014030, 00014032, 00014033
830.6302	Color	Y	00014021
830.6303	Physical State	Y	00014021
830.6304	Odor	Y	00014021
830.6313	Stability	Y	00014021
830.6314	Oxidation/Reduction	N	
830.6315	Flammability	N/A [5]	
830.6316	Explodability	N	
830.6317	Storage Stability	N	
830.6319	Miscibility	N/A [5]	
830.6320	Corrosion Characteristics	Y	00014021
830.7000	pH	N	
830.7050	UV/Visible Absorption	N [6]	
830.7100	Viscosity	N/A [5]	
830.7200	Melting Point/Melting Range	N	
830.7220	Boiling Point/Boiling Range	N/A [5]	
830.7300	Density/Relative Density/Bulk Density	Y	00014021
830.7370	Dissociation Constant in Water	N	
830.7550 830.7560 830.7570	Partition Coefficient (Octanol/Water)	N	
830.7840 830.7860	Solubility	Y	00014021
830.7950	Vapor Pressure	Y	00014021

[1] Y = Yes; N = No; N/A = Not Applicable.

[2] All references were reviewed in the Product Chemistry Chapter of the Methamidophos Reregistration Standard dated 9/30/92. We note that at that time the Chevron product was produced by Mobay Corp. If the product source has changed, all new product chemistry data will be required.

[3] Additional information is required concerning the composition of the starting materials and intermediates and the measures taken to assure the quality of the final product.

[4] Additional validation data and detection limits are required for the enforcement analytical methods used to determine the active ingredients and impurities.

[5] Data are not required because the TGAI/MP is a solid at room temperature.

[6] The OPPTS Series 830, Product Properties Test Guidelines require data pertaining to UV/visible absorption for the PAI.

METHAMIDOPHOS

REREGISTRATION ELIGIBILITY DECISION

RESIDUE CHEMISTRY CONSIDERATIONS

PC Code. 101201; Case 0043

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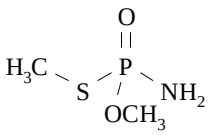
METHAMIDOPHOS



REREGISTRATION ELIGIBILITY DECISION

RESIDUE CHEMISTRY CONSIDERATIONS

PC Code No. 101201; Case 0043

INTRODUCTION

Methamidophos (O,S-dimethyl phosphoramidothioate) is a FIFRA '88 List A pesticide active ingredient. It is an acaricide/insecticide manufactured in the United States by Bayer Corporation and Valent U.S.A. Corporation under the trade name Monitor®. A search of the Agency's Reference Files System (REFS) indicated that methamidophos is currently registered by the basic producers for food/feed uses on cotton, potatoes, and tomatoes. The emulsifiable concentrate (EC) formulation is the sole formulation class registered for use on these sites. This formulation is typically applied as foliar treatments using ground or aerial equipment.

REGULATORY BACKGROUND

Methamidophos was the subject of a Reregistration Standard Guidance Document dated 9/30/82; the Residue Chemistry Science Chapter of the Guidance Document was dated 2/19/82. Subsequent addenda to the Methamidophos Reregistration Standard were issued 4/4/82, 7/25/85, and 1/30/86. These documents summarized the status of residue chemistry data requirements with respect to the reregistration of methamidophos.

Tolerances have been established for residues of methamidophos in/on various raw agricultural commodities [40 CFR §180.315(a) and (b)]. In addition, tolerances have been established for combined residues of acephate and its metabolite methamidophos in/on various plant and animal commodities [40 CFR §180.108(a) and (b)]. Tolerances established for acephate in/on several commodities (beans, Brussels sprouts, cauliflower, celery, cranberries, lettuce, mint hay, and peppers) include limits on residues of methamidophos. Adequate methods are available for the enforcement of established tolerances. The Pesticide Analytical Manual (PAM) Volume II lists Method I, a GLC method employing thermionic detection, as well as Method A, a confirmatory TLC method. Codex MRLs have been established for residues of methamidophos per se.

The Agency has recently updated the list of raw agricultural and processed commodities and feedstuffs derived from crops (Table 1, OPPTS 860.1000). As a result of changes to Table 1, additional methamidophos residue data are now required for some commodities; these data requirements have been incorporated into this document. These new data requirements will be imposed at the issuance of the Methamidophos RED but

should not affect on the reregistration eligibility decisions for methamidophos.

SUMMARY OF SCIENCE FINDINGS

GLN 860.1200: Directions for Use

The basic producers of methamidophos are Bayer Corporation and Valent U.S.A. Corporation, and the majority of residue chemistry data in support of reregistration were submitted by these registrants. According to a REFS search, conducted on 11/19/97, there are 2 active end-use products (EPs) registered under FIFRA Section 3. These EPs, including the associated Special Local Need (SLN) registrations under FIFRA Section 24(c), are listed in Table A1. For the purpose of generating this Residue Chemistry Chapter, the Agency examined the registered food/feed use patterns and reevaluated the available residue chemistry database for adequacy in supporting these use patterns, based on the product labels registered to Bayer and Valent U.S.A.. These use patterns are presented in Table A2.

Table A1. Methamidophos EPs with Food/Feed Uses Registered to Bayer Corporation and Valent U.S.A. Corporation.

EPA Reg. No.	Label Acceptance Date [1]	Formulation	Product Name
3125-280 [2]	12/31/97	4 lb/gal EC	Monitor 4 Liquid Insecticide
59639-56 [3]	12/31/97	4 lb/gal EC	Monitor 4 Spray

[1] Date of the most recently EPA-approved label found by reviewer in the product jacket or Pesticide Product Label System (PPLS) unless specified otherwise.

[2] Including SLN Nos. AL890008, AR810044, AR970004, CA780163, CA790188, DE910002, FL800046, IN790001, LA910008, MD910009, MI780016, MS810014, MS810055, NC890007, NJ900006, NJ960010, OH790008, PR920001, TN890007, TN960006, TX910016, and VA910005.

[3] Including SLN Nos. AL870007, AR890005, CA780189, CA790096, DE920002, FL890007, FL890041, FL920004, IN930003, LA830018, LA910016, MI930003, MS830013, OH790010, SC780016, TN880004, TN930003, TX910012, and VA930002.

EPA issued a notice of termination of the use of methamidophos on all crops except tomatoes, cotton and potatoes by deleting uses from all methamidophos FIFRA Section 3 registrations, and cancellation of all methamidophos 24(c) food-use registrations not labeled for use on tomatoes only. The notice was published in the Federal Register on 12/23/97 (62 FR 67071-67072). A list of FIFRA Section 3 registrations to be amended to terminate methamidophos uses based on a request from Bayer and Valent include the use of methamidophos on broccoli, Brussels sprouts, cabbage, cauliflower, celery, and sugar beets.

A list of 24(c) registrations labeled for alfalfa, Bermuda grass, clover, cucumbers, eggplant, lettuce, melons, and peppers have been canceled on 12/23/97, leaving tomatoes as the only remaining food use with methamidophos 24(c) registrations. The 24(c) registrations for which Bayer and Valent have requested cancellation include SLN Nos. AZ820013, AZ890020, AZ900011, AZ930005, AZ930006, CA800186, CA830064, CA840218, CA870014, CA880020, CA880021, FL810009, FL890010, FL810012, FL810033, FL810034, FL890006, FL890011, FL890012, FL890013, FL890014, FL920012, FL960003, FL960013, GA860004, GA900001, GA900004, GA900005, GA930006, GA930007, LA910007, LA910009, LA910010,

LA910011, LA910012, NM820008, TX820019, TX840020, TX890007, and TX890008.

EPA issued a notice of receipt of requests to voluntarily cancel certain pesticide registrations. The notice was published in the Federal Register on 2/11/98 (63 FR 6930-6933). The following Bayer 24© registrations will be canceled on 8/10/98 unless the request is withdrawn: SLN Nos. AZ820013, AZ900011, CA800186, CA830064, CA840218, CA870014, CA880021, FL810009, FL810012, FL810033, FL810034, FL920012, FL960013, GA900004, GA930006, LA910007, LA910009, NM820008, TX820019, and TX840020.

As a result of the deletion of these uses by Bayer and Valent, residue chemistry data are not required and tolerances need not be proposed for the reregistration of these uses.

The registrants must modify all product labels with uses on cotton, potatoes, and tomatoes to specify a maximum seasonal rate and/or maximum number of applications per season. These label modifications should be supported by adequate field residue data.

One SLN registration for use of methamidophos on tomatoes specifies different use directions for tomatoes destined to be processed. The Agency does not believe that such a restriction is practical, and therefore, this restriction must be removed from the label. Additionally, the cotton labels contain grazing/feeding restrictions that HED also believes to be impractical. These restrictions must be removed from the labels.

A tabular summary of the residue chemistry science assessments for reregistration of methamidophos is presented in Table B. The status of reregistration requirements for each guideline topic listed in Table B is based on the use patterns registered by the basic producers, Bayer and Valent U.S.A. Corporation. When end-use product DCIs are developed (e.g., at issuance of the RED), RD should require that all end-use product labels (e.g., MAI labels, SLNs, and products subject to the generic data exemption) be amended such that they are consistent with the basic producer labels.

GLN 860.1300: Nature of the Residue - Plants

The reregistration requirements for plant metabolism are partially fulfilled. Studies depicting the qualitative nature of the residue in lettuce and potatoes have been submitted and deemed adequate pending submission of additional supporting storage stability data. To fulfill data requirements, the registrant must submit information regarding the dates of final sample analysis, and provide data indicating that the metabolite profile in lettuce and potato commodities did not change over the intervals for which samples were stored.

Based on the findings of the lettuce and potato metabolism studies, in plants methamidophos undergoes cleavage of the P--S bond to produce the intermediate methanethiol, which in turn is oxidized to methanesulfonic acid. Cleavage of the C--S bond in methanesulfonic acid produces CO_2, which is incorporated by photosynthesis into sugars, starch, lipids, amino acids, and proteins. In lettuce, formation of the S-methyl phosphorothioate conjugate is expected to result from hydrolysis of the P--N bond of methamidophos to produce DMPT, which is in turn hydrolyzed. In potatoes, where the majority of radioactivity was present in starch, initial cleavage of the P--S bond to produce methanethiol and the majority of incorporation of CO_2 into sugars is believed to take place in the foliage, after which the byproducts are transported to the tuber.

Based on the available plant metabolism data, the residue of concern in plant commodities is methamidophos per se.

GLN 860.1300: Nature of the Residue - Animals

The reregistration requirements for animal metabolism are fulfilled. Acceptable goat and hen metabolism studies have been submitted and evaluated. Based on the available animal metabolism data, it has been determined that no tolerances are required for animal commodities pursuant to 40 CFR 180.6(a)(3).

In animals, methamidophos undergoes methyl transfer of the S-methyl moiety to form methionine, and subsequent transfer or oxidation of the methyl group via S-adenosyl methionine to form choline and phospholipids including phosphatidylcholine. Oxidation of the S-methyl group of S-adenosyl methionine may also lead to the production of CO_2, and reincorporation into animal metabolic pathways and finally into natural products such as lactose, triglycerides, and amino acids.

GLN 860.1340: Residue Analytical Methods

Adequate methods are available for data collection and tolerance enforcement for plant commodities. For tolerance enforcement, the Pesticide Analytical Manual (PAM) Vol. II lists a GLC method (designated as Method I) with thermionic detection for the determination of methamidophos (LOD = 0.01 ppm) residues in/on plant commodities. PAM Vol. II also lists a TLC method (designated as Method A) as a confirmatory method. Adequate radiovalidation data for the enforcement method using samples from the plant metabolism studies have been submitted and evaluated.

Because no tolerances are required for animal commodities, no enforcement method for animal commodities is required.

GLN 860.1360: Multiresidue Methods

The 2/97 FDA PESTDATA database (PAM Volume I, Appendix I) indicates that methamidophos is completely recovered (>80%) using Multiresidue Methods Section 302 (Luke Method; Protocol D).

GLN 860.1380: Storage Stability Data

The reregistration requirements for storage stability data are not fulfilled. Adequate storage stability data to support the outstanding processing studies must be submitted.

The available storage stability data indicate that weathered residues of methamidophos are stable during frozen storage for up to 9 months in broccoli, 2 months in lettuce, 8 months in cabbage, 6 months in cauliflower, 5 months in Brussels sprouts, 24 months in potato tubers, potato granules, potato dry peel, tomato fruit, and tomato puree and 3 months in tomato dry pomace.
These data adequately support the reregistration requirements for storage stability.

GLN 860.1500: Crop Field Trials

The reregistration requirements for magnitude of the residue in/on the following raw agricultural commodities (RACs) have been fulfilled: cotton, seed; cotton gin byproducts; potatoes; and tomatoes. Overall, adequate field trial data depicting methamidophos residues of concern following treatments according to the maximum registered use patterns have been submitted for the RACs listed above. Label revisions are required for some crops in order to reflect current Agency policies and/or to reflect the parameters of use patterns for which field trial data are available. Details of the required label amendments are presented in the endonotes for GLN 860.1200 (Directions for Use) of Table B. Refer to the " Tolerance Reassessment Summary" section for recommendations with respect to established tolerance levels.

The use of methamidophos on the following crops is not being supported by the registrants, which have deleted these crops as sites from their Section 3 labels: beets, sugar; broccoli; Brussels sprouts; cabbage; cauliflower; celery; cucumber; eggplant; lettuce, head; and melons; and peppers. Therefore, no additional field trial data are required for these crops. The registrant; however, has recently submitted an import tolerance petition for peppers along with strawberries, and squash (PP#9E5040). These petitions have not been reviewed by HED but these commodities were included in the risk assessment (monitoring data used) as per an agreement with the registrant.

GLN 860.1520: Processed Food/Feed

The reregistration requirements for magnitude of the residue in the processed commodities of cottonseed and potatoes have been fulfilled.

A tomato processing study has been submitted which indicated concentration of residues in dried tomato pomace but no concentration in wet pomace, juice, puree, and canned tomatoes; the study did not include tomato paste. A tolerance for dried tomato pomace is not required as it is no longer considered a major livestock feed item. However, FDA Surveillance Monitoring Data indicated that residues of methamidophos may concentrate in tomato paste since residues in paste were greater than residues in tomatoes. Therefore, the registrants must submit processing data for tomato paste.

The registrant has submitted an acceptable potato processing study and no further potato processing data are required.Residues on the raw agricultural commodity (RAC), potato granules, dried potato slices, and dried

potato peel were non-detectable. Non-quantifiable residues were found in wet potato peel. The residues in potato granules, dried potato slices, and potato peel should be assumed to be equal to the RAC in future risk assessments. Residues at twice the limit of quantitation were found in potato chips. Because residues in the RAC were non-detectable, the concentration factor in chips could not be exactly determined, but was estimated to be 10x. This is based on an estimate of the limit of detection for the method. HED recommends that a tolerance of 0.5 ppm be established in/on potato chips.

GLN 860.1480: Meat, Milk, Poultry, Eggs

The reregistration requirements for magnitude of the residue in meat, milk, poultry, and eggs are fulfilled. Based on the results of the methamidophos animal metabolism studies, tolerances for residues of methamidophos in animal commodities are not required. In addition, because residues of methamidophos were nondetectable in animal commodities from the available feeding studies with acephate and methamidophos (see Acephate Reregistration Standard Update, dated 1/29/92), tolerances for methamidophos residues in animal commodities are not required to support use of acephate on livestock feed items.

GLN 860.1400: Water, Fish, and Irrigated Crops

Methamidophos is presently not registered for direct use on water and aquatic food and feed crops; therefore, no residue chemistry data are required under these guideline topics.

GLN 860.1460: Food Handling

Methamidophos is presently not registered for use in food-handling establishments; therefore, no residue chemistry data are required under this guideline topic.

GLN 860.1850 and 860.1900: Confined/Field Accumulation in Rotational Crops

Provided that the registrants establish a 150-day plantback interval for all crops, the reregistration requirements for confined rotational crops are fulfilled. If the registrants desire a shorter plantback interval, then additional characterization data for the available confined rotational crop study must be submitted. Field rotational crop studies may be required if the registrants desire plantback intervals shorter than 150 days. Currently, there are no plantback intervals listed on product labels.

Table A2. Food/Feed Use Patterns on EP Labels Subject to Reregistration for Methamidophos (Case 0043).

Site Application Type Application Timing Application Equipment	Formulation [EPA Reg. No.]	Maximum Single Application Rate, ai	Maximum Number of Applications Per Season	Maximum Seasonal Rate, ai	Preharvest Interval, Days	Use Directions and Limitations
Cotton						
Foliar (before bolls open) Ground or aerial	4 lb/gal EC [3125-280] [AR870007] [MS810014]	1.0 lb/A	NS	NS	50	Applications may be made in a minimum of 25 gal/A by ground, 3 gal/A by air, or by irrigation systems. The feeding of gin trash to livestock or grazing of animals on treated fields is prohibited.
	4 lb/gal EC [59639-56]	1.0 lb/A	NS	NS	50	Applications may be made in a minimum of 25 gal/A by ground or 3 gal/A by air. The feeding of gin trash to livestock or grazing of animals on treated fields is prohibited.
Foliar Ground or aerial	4 lb/gal EC [AR810044] [AR890005] [CA780189] [CA790188] [LA830018] [MS810055] [MS830013] [TN880004]	1.0 lb/A	NS	NS	NS	Use limited to AR, CA, LA, MS, and TN. Applications after 65% of the bolls are open are prohibited. Applications may be made in a minimum of 25 gal/A by ground or 1 gal/A by air (MS810055 only). The feeding of gin trash to livestock or grazing of animals on treated fields is prohibited.

(continued)

Table A2 *(continued)*.

Site Application Type Application Timing Application Equipment	Formulation [EPA Reg. No.]	Maximum Single Application Rate, ai	Maximum Number of Applications Per Season	Maximum Seasonal Rate, ai	Preharvest Interval, Days	Use Directions and Limitations
Potato						
Foliar Ground or aerial	4 lb/gal EC [3125-280]	1.0 lb/A	NS	4.0 lb/A	14	Applications may be made in a minimum of 25 gal/A by ground, 3 gal/A by air, or by irrigation systems with a retreatment interval of 7- to 10- days as a preventative program or as needed.
	4 lb/gal EC [59639-56]	1.0 lb/A	NS	NS	14	Applications may be made in a minimum of 25 gal/A by ground, 3 gal/A by air, or by sprinkler irrigation systems with a retreatment interval of 7- to 10- days as a preventative program or as needed.

(continued)

Table A2 *(continued)*.

Site Application Type Application Timing Application Equipment	Formulation [EPA Reg. No.]	Maximum Single Application Rate, ai	Maximum Number of Applications Per Season	Maximum Seasonal Rate, ai	Preharvest Interval, Days	Use Directions and Limitations
Tomato (fresh fruit)						
Foliar Ground	4 lb/gal EC [FL890041]	1.0 lb/A	NS	5.0 lb/A	7	Tank mix use limited to FL.
	4 lb/gal EC [FL920004]	1.0 lb/A	NS	9.0 lb/A	7	Use limited to FL. Applications may be made in a minimum of 25 gal/A by ground with a retreatment interval of 5- to 7-days.
	4 lb/gal EC [IN790001] [IN930003] [MI780016] [MI930003] [OH790008] [OH790010]	1.0 lb/A	3	NS	7	Use limited to IN, MI, and OH. Applications may be made in a minimum of 25 gal/A by ground with a retreatment interval of 7- to 10-days.
	4 lb/gal EC [SC780016]	1.0 lb/A	5	5.0 lb/A	14	Use limited to SC. Applications may be made in a minimum of 50 gal/A by ground with a retreatment interval of 7- to 10-days.
	4 lb/gal EC [AL890008]	0.75 lb/A	NS	5.0 lb/A	7	Use limited to AL and GA. Applications may be made in a minimum of 25 gal/A by ground with a retreatment interval of 5- to 7-days.
	4 lb/gal EC [PR920001]	0.75 lb/A	NS	5.0 lb/A	7	Use limited to PR. Applications may be made in a minimum of 25 gal/A by ground with a retreatment interval of 7- to 10-days.

(continued)

Table A2 *(continued)*.

Site Application Type Application Timing Application Equipment	Formulation [EPA Reg. No.]	Maximum Single Application Rate, ai	Maximum Number of Applications Per Season	Maximum Seasonal Rate, ai	Preharvest Interval, Days	Use Directions and Limitations
Tomato (fresh fruit)(continued)						
Foliar Ground or aerial	4 lb/gal EC [TX910016]	1.0 lb/A	5	NS	14	Use limited to TX. Applications may be made alone or as a tank mix with a pyrethroid. Applications may be made in a minimum of 25 gal/A by ground or 5 gal/A by air with a retreatment interval of 7- to 10-days.
	4 lb/gal EC [FL800046] [FL890007] [LA910016] [TX910012]	1.0 lb/A	NS	5.0 lb/A	7	Use limited to FL, LA, and TX. Applications may be made in a minimum of 25 gal/A by ground or 3 gal/A by air with a retreatment interval of 7- to 10-days.
	4 lb/gal EC [AR970004] [CA780163] [CA790096] [DE910002] [DE920002] [LA910008] [MD910009] [NC890007] [NJ900006] [NJ960010] [TN890007] [TN930003] [TN960006] [VA910005] [VA930002]	1.0 lb/A	5	NS	7	Use limited to AR, CA, DE, LA, MD, NC, NJ, TN, and VA. Applications may be made in a minimum of 25 gal/A by ground or 5 gal/A by air with a retreatment interval of 7- to 10-days.

(continued)

Table A2 *(continued)*.

Site Application Type Application Timing Application Equipment	Formulation [EPA Reg. No.]	Maximum Single Application Rate, ai	Maximum Number of Applications Per Season	Maximum Seasonal Rate, ai	Preharvest Interval, Days	Use Directions and Limitations
Tomato (fruit for processing)						
Foliar Ground or aerial	4 lb/gal EC [CA780163]	1.0 lb/A	2	NS	14	Use limited to CA. Applications may be made in a minimum of 25 gal/A by ground or 5 gal/A by air with a retreatment interval of 7- to 10-days.

Table B. Residue Chemistry Science Assessments for Reregistration of Methamidophos.

GLN: Data Requirements	Current Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References [1]
860.1200: Directions for Use	N/A = Not Applicable	Yes [2]	
860.1300: Plant Metabolism	N/A	Yes [3]	00014077, 00014081, 44209701-44209702 [4]
860.1300: Animal Metabolism	N/A	No	00014555, 00014995, 00015222, 44209703-44209704 [4]
860.1340: Residue Analytical Methods			
- Plant commodities	N/A	No	00014085, 44209705-44209706 [4]
- Animal commodities	N/A	No	44209707-44209708 [4]
860.1360: Multiresidue Methods	N/A	No	
860.1380: Storage Stability Data	N/A	Yes [5]	44514302[7]
860.1500: Crop Field Trials			
Root and Tuber Vegetables Group			
- Beets, sugar, roots	0.02 [§180.315(a)]	No [6]	00013677, 00014266, 00014269
- Potatoes	0.1 [§180.315(a)]	No [7]	00014075, 40747301[8], 44512201[7]
Leaves of Root and Tuber Vegetables Group			
- Beets, sugar, tops	0.50 [§180.315(a)]	No [6]	00013677, 00014266, 00014269
Leafy Vegetables (except Brassica) Vegetables Group			
- Celery	1 [§180.315(b)]	No [6]	
- Lettuce	1.0 [§180.315(a)]	No [6]	00014073
Brassica (Cole) Vegetables Group			
- Broccoli	1.0 [§180.315(a)]	No [6]	00014069
- Brussels sprouts	1.0 [§180.315(a)]	No [6]	00014070
- Cabbage	1.0 [§180.315(a)]	No [6]	00014071

(continued; footnotes follow)

GLN: Data Requirements	Current Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References [1]
- Cauliflower	1.0 [§180.315(a)]	No [6]	00014072
Fruiting Vegetables (Except Cucurbits) Group			
- Eggplant	1.0 [§180.315(a)]	No [6]	00014119, 00014120, 00014130, 00014131
- Peppers	1.0 [§180.315(a)]	No [6]	00014121, 00014122, 00014123, 00014140
- Tomatoes	1.0 [§180.315(a)]	No [7]	00014124-00014129, 40007401[9], 44514301[7]
Cucurbit Vegetables Group			
- Cucumbers	1.0 [§180.315(a)]	No [6]	00014132, 00014133, 00014138, 00014139
- Melons	0.5 [§180.315(a)]	No [6]	00014134, 00014135
Miscellaneous Commodities			
- Cotton, seed and gin byproducts	0.1 [§180.315(a)]	No [10]	00014074, 44558801
860.1520: Processed Food/Feed			
- Beets, sugar	None established	No [6]	
- Cotton, seed	None established	No	41966302 [11]
- Potatoes	None established	No	44815406 [12]
- Tomatoes	None established	Yes [13]	40007401 [9]
860.1480: Meat, Milk, Poultry, Eggs			
- Milk and the Fat, Meat, and Meat Byproducts of Cattle, Goats, Hogs, Horses, and Sheep	None established	No	00015183, 00015225
- Eggs and the Fat, Meat, and Meat Byproducts of Poultry	None established	No	
860.1400: Water, Fish, and Irrigated Crops	N/A	N/A	
860.1460: Food Handling	N/A	N/A	
860.1850: Confined Rotational Crops	N/A	Reserved [14]	42758701 [15]
860.1900: Field Rotational Crops	None established	Reserved [16]	

1. References without endnotes were reviewed in the Residue Chemistry Science Chapter of the Methamidophos Guidance Document, dated 2/19/82. Otherwise, references were reviewed as noted.

2. The registrants must modify all product labels with uses on cotton, potatoes, and tomatoes to specify a maximum seasonal rate and/or maximum number of applications per season. These label modifications should be supported by adequate field residue data.

   One SLN registration (CA780163) for use of methamidophos on tomatoes specifies different use directions for tomatoes destined to be processed. The Agency does not believe that such a restriction is practical and therefore this restriction must be removed from the label. Feeding/grazing restrictions on the cotton labels must also be removed. The Agency does not believe that such a restriction is practical.

3. The registrants must submit the dates of final sample analysis and provide data confirming that the metabolite profiles in lettuce and potatoes did not change over the intervals for which samples were stored.

4. DP Barcodes D233457, D235726, and D235728, 2/2/98, F. Fort.

5. Adequate storage stability data to support the outstanding processing studies must be submitted.

6. The registrants are not supporting reregistration of methamidophos uses on this commodity.

7. DP Barcodes D244839, D244840, 6/11/98, F. Fort.

8. CB No. 4709, 6/14/89, W. Chin.

9. CB Nos. 2527, 2528, 2730, and 2731; 3/4/88; A. Smith.

10. DP Barcode D246612, 9/ 98; F. Fort

11. CB No. 9196, DP Barcode D172628, 5/15/92, E. Zager.

12. DP Barcode D256034, 8/11/99; C. Olinger

13. Because monitoring data indicated that methamidophos residues may concentrate in tomato paste (CB No. 17068, DP Barcode D224585, 4/16/96, D. Hrdy), the registrants must submit processing data for tomato paste.

14. If the registrants desire a plantback interval shorter than 150 days, then additional characterization of bound residues in wheat straw from the 29-day plantback interval will be required.

15. CB No. 15088, DP Barcode D211934, 9/5/95, F. Fort.

16. Field rotational crop studies may be required if the registrants desire plantback intervals shorter than 150 days.

TOLERANCE REASSESSMENT SUMMARY

Tolerances for residues of methamidophos in/on plant commodities [40 CFR §180.315 (a) and (b)] are currently expressed in terms of residues of methamidophos per se.

The available plant and animal metabolism studies indicate that the residue of concern is the parent methamidophos. Methamidophos is also a metabolite of acephate. It has previously been recommended that residues of methamidophos resulting from the metabolism of acephate be included under the tolerance regulations for methamidophos as a pesticide [40 CFR §180.315(c)]. This change is needed to achieve compatibility with the MRLs of the Codex Alimentarius Commission, if only in terms of residue definition. Such a change in the residue definition requires deletion of paragraph (d) (8) of 40 CFR §180.3 which states that methamidophos residues may not exceed the higher of the two tolerances established for the use of acephate or methamidophos as a pesticide.

The listing of methamidophos tolerances under 40 CFR §180.315 should be subdivided into parts (a), (b), and (c). Part (a) should be reserved for permanent tolerances, part (b) for tolerances with regional registration, and part (c) for tolerances reflecting use of acephate formulations alone (i.e., no methamidophos formulations are registered for use on these commodities).

The Agency has recently updated the list of raw agricultural and processed commodities and feedstuffs derived from crops (Table 1, OPPTS GLN 860.1000). As a result of changes to Table 1, methamidophos tolerances for certain RACs which have been removed from the livestock feeds table should be revoked. Also, some commodity definitions must be corrected. A summary of methamidophos tolerance reassessments is presented in Table C.

Tolerances Listed Under 40 CFR §180.315 (a):

Pending label amendments for some crops, adequate field trial data are available to reassess the established tolerances for cottonseed, potatoes, and tomatoes. The available data suggest that the tolerance levels for cottonseed and tomato should be raised to 0.2 ppm and 2.0 ppm, respectively.

The registrants are not supporting use of methamidophos on Brussels sprouts, cauliflower, lettuce, and peppers. Because there are registered acephate uses on these crops, methamidophos tolerances for these crops should be moved to 40 CFR §180.315(c).

The following tolerances should be revoked as the registrants are not supporting methamidophos uses and there are no registered acephate uses on these commodities: beets, sugar, roots; beets, sugar, tops; broccoli; cabbage; cucumbers; eggplant; and melons.

Tolerance to be Proposed Under 40 CFR §180.315 (a):

A tolerance for residues of methamidophos in/on cotton gin byproducts must be proposed. The available data support a tolerance level of 10 ppm. A tolerance for residues of methamidophos in potato chips must be proposed. The available data support a tolerance of 0.5 ppm.

Tolerance Listed Under 40 CFR §180.315 (b):

The registrants are not supporting use of methamidophos on celery. Because there are registered acephate uses on this crop, the methamidophos tolerance for this crop should be moved to 40 CFR §180.315(c).

Tolerances to be Listed Under 40 CFR §180.315(c):

The basic producer of acephate (Valent U.S.A. Corporation) intends to support use of acephate on the following food/feed crops: beans (snap, dry, and lima); Brussels sprouts; cauliflower; celery; cotton; cranberries; lettuce, head; peanut; pepper, non-bell; pepper, bell; peppermint/spearmint; soybean; and tobacco. Therefore, tolerances for residues of methamidophos in/on these commodities (except tobacco) resulting from use of acephate should be established under 40 CFR §180.315(c). The tolerance expression in this section should read: "Tolerances are established for residues of methamidophos in or on the following raw agricultural commodities as a result of the application of acephate:".

Sufficient field trial data are available to determine appropriate tolerance levels for methamidophos in/on the following commodities, as currently defined: beans (succulent and dry form); Brussels sprouts; cauliflower; celery; cranberries; food items in food-handling establishments as a result of spot and/or crack and crevice treatments; lettuce; peppers; and soybeans.

Tolerances for combined residues of acephate and methamidophos in cottonseed meal and hulls have been established (40 CFR §180.108). However, based on a cottonseed processing study submitted to satisfy methamidophos reregistration requirements, methamidophos residues do not concentrate in cottonseed processed commodities. Therefore, tolerances for methamidophos residues in cottonseed processed commodities are not required under 40 CFR §180.315(c).

A tolerance for the combined residues of acephate and methamidophos in soybean meal has been established (40 CFR §180.108). Data for soybean processed commodities were reviewed in the Acephate Reregistration Standard Update (dated 1/29/92). In one study conducted in 1978, soybeans were treated with three applications of a 75% SC/S formulation at 1 or 2 lb ai/A/application (2x or 4x the maximum seasonal rate Valent wishes to support). Methamidophos residues were found to concentrate slightly in soybean meal (average concentration of 1.2x) and hulls (average concentration of 1.9x) but not in crude oil. In a second study conducted in 1987, soybeans were treated with 11 applications of a 75% SC/S formulation at 2 lb ai/A/application (~15x the maximum seasonal rate Valent wishes to support). Methamidophos residues were 0.01-0.02 ppm in/on soybeans, 0.02 ppm in meal, 0.02 ppm in hulls and <0.01 ppm in refined oil. Based on the exaggeration rates used in the studies and the resulting residues in processed commodities, the Agency concludes that no tolerances are required for methamidophos residues in soybean processed commodities .

Pending Tolerance Petitions:

The following petition has not been reviewed but the commodities of interest will be included in the risk assessment as per the registrant request. FDA monitoring data will used to determine the anticipated residues to be used in the assessment.

PP#9E5040: The registrant has submitted an import tolerance petition for peppers, strawberries, and squash. There is an existing tolerance for methamidophos on peppers, but none has been established for the latter two commodities.

The following pending petitions were not included in the reregistration eligibility decision.

PP#5F1571/FAP#5H5071: Chevron Chemical Company and Bayer proposed revised tolerances for residues of methamidophos in/on cauliflower and tomatoes at 2.0 ppm. A tolerance of 10 ppm for dried tomato pomace was also proposed.

PP#6E3418: IR-4 proposed a tolerance for residues of methamidophos in/on collards at 1.0 ppm.

PP#6F3317/6H5480: Bayer proposed tolerances for residues of methamidophos in/on the following commodities: lentils (0.5 ppm); lentil, vines (8.0 ppm); melons (1.5 ppm); milk (0.05 ppm); peanuts (0.2 ppm); peanut, hulls (0.4 ppm); peas, green (1.0 ppm); peas, green vines (12.0 ppm); peas, dry (0.1 ppm); peas, dry vines (4.0 ppm); soybeans (0.2 ppm); soybean hay (1.5 ppm); watermelons (1.5 ppm). Tolerances for peanut meal (0.4 ppm), soybean hulls (3.0 ppm), and soybean meal (0.4 ppm) were also proposed.

PP#5E3290: IR-4 proposed a tolerance for residues of methamidophos in/on Chinese radish roots at 0.1 ppm.

Table C. Tolerance Reassessment Summary for Methamidophos.

Commodity	Tolerance Listed Under 40 CFR §180.315	Reassessed Tolerance	Tolerance [1] Listed Under 40 CFR §180.108	Comment [Correct Commodity Definition]
Tolerances Listed Under 40 CFR §180.315 (a)				
Beets, sugar, roots	0.02	Revoke	--	The registrants are not supporting methamidophos use on sugar beets and there are no registered acephate uses.
Beets, sugar, tops	0.50	Revoke	--	
Broccoli	1.0	Revoke	--	The registrants are not supporting methamidophos use on broccoli and there are no registered acephate uses.
Brussels sprouts	1.0	1.0	0.5	This tolerance must be moved to §180.315(c).
Cabbage	1.0	Revoke	--	The registrants are not supporting methamidophos use on cabbage and there are no registered acephate uses.
Cauliflower	1.0	0.5	0.5	This tolerance must be moved to §180.315(c).
Cottonseed	0.1 (N)	0.2	--	[Cotton, undelinted seed]
Cucumbers	1.0	Revoke	--	The registrants are not supporting methamidophos use on cucumbers and there are no registered acephate uses.
Eggplant	1.0	Revoke	--	The registrants are not supporting methamidophos use on eggplant and there are no registered acephate uses.
Lettuce, head	1.0	1.0	1	This tolerance must be moved to §180.315(c).
Melons	0.5	Revoke	--	The registrants are not supporting methamidophos use on melons and there are no registered acephate uses.
Peppers	1.0	1.0	1	This tolerance must be moved to §180.315(c). [Pepper, bell and non-bell]
Potatoes	0.1(N)	0.1	--	
Tomatoes	1.0	2.0	--	

(continued; footnotes follow)

Table C *(continued)*.

Commodity	Tolerance Listed Under 40 CFR §180.315	Reassessed Tolerance	Tolerance [1] Listed Under 40 CFR §180.108	Comment [Correct Commodity Definition]
Tolerance To Be Proposed Under 40 CFR §180.315 (a)				
Cotton, gin byproducts	--	10	--	
Tolerance Listed Under 40 CFR §180.315 (b)				
Celery	1	1.0	1	This tolerance must be moved to §180.315(c).
Tolerances to be Listed Under 40 CFR §180.315(c)				
Beans (succulent and dry form)	--	1.0	1	[Beans, dry and succulent]
Brussels sprouts	1.0	1.0	0.5	
Cauliflower	1.0	0.5	0.5	
Celery	1	1.0	1	
Cranberries	--	0.1	0.1	
Lettuce	1.0	1.0	1	[Lettuce, head]
Mint hay	--	2	1	[Mint, tops (leaves and stem)]
Peppers	1.0	1.0	1	[Peppers, bell and non-bell]
Soybeans	--	--	1	

[1] Tolerances listed in 40 CFR §180.108 are expressed in terms of the combined residues of acephate and methamidophos; several tolerances have limits on methamidophos levels. Tolerance levels listed in this column in italics are for the combined residues of acephate and methamidophos. Unitalicized tolerance levels are the methamidophos limits.

[2] Tolerance formerly listed in 40 CFR §186.100, moved to 40 CFR §180.108 (63 FR 2163, 1/14/98).

[3] Tolerance formerly listed in 40 CFR §185.100, moved to 40 CFR §180.108 (63 FR 2163, 1/14/98).

CODEX HARMONIZATION

The Codex Alimentarius Commission has established several maximum residue limits (MRLs) for residues of methamidophos in/on various plant and animal commodities. The Codex MRLs are expressed in terms of methamidophos per se. The expression of residues for Codex MRLs and U.S. tolerances is harmonized. A numerical comparison of the Codex MRLs and the corresponding reassessed U.S. tolerances is presented in Table D.

Table D. Codex MRLs and applicable U.S. tolerances for methamidophos. Recommendations for compatibility are based on conclusions following reassessment of U.S. tolerances (see Table C).

Codex			Reassessed U.S. Tolerance, ppm	Recommendation And Comments
Commodity, As Defined	MRL (mg/kg)	Step		
Alfalfa forage (green)	2 [1]	CXL	--	No U.S. registrations.
Brussels sprouts	1	CXL	1.0	
Cabbages, Head	0.5 [2]	3	--	U.S. registrants not supporting use.
Cattle fat	0.01 (*) [3]	CXL	--	
Cattle meat	0.01 (*)	CXL	--	
Cauliflower	0.5 [2]	3	0.5	
Celery	1	CXL	1.0	
Cotton seed	0.1 [4]	8	0.2	
Cucumber	1	CXL	--	U.S. registrants not supporting use.
Goat fat	0.01 (*)	CXL	--	
Goat meat	0.01 (*)	CXL	--	
Hops, dry	5	CXL	--	No U.S. registrations.
Lettuce, Head	1	CXL	1.0	
Melons, except Watermelon	0.5	CXL-D	--	U.S. registrants not supporting use.
Milks	0.01 (*)	CXL	--	
Peach	1 [2]	3	--	No U.S. registrations.
Peppers, Chili	2	CXL	1.0	
Peppers, Sweet	1	CXL	1.0	
Pome fruits	0.5	7B	--	No U.S. registrations
Potato	0.05 [4]	8	0.1	
Rape seed	0.1	CXL	--	No U.S. registrations
Sheep fat	0.01 (*)	CXL	--	
Sheep meat	0.01 (*)	CXL	--	
Soya bean (dry)	0.05 [1]	CXL	0.01	

(continued; footnotes follow)

Codex			Reassessed U.S. Tolerance, ppm	Recommendation And Comments
Commodity, As Defined	MRL (mg/kg)	Step		
Sugar beet	0.05	CXL	--	U.S. registrants not supporting use.
Sugar beet leaves or tops	1	CXL	--	U.S. registrants not supporting use.
Tomato	1 [2]	3	2	
Tree tomato	0.01 (*) [1]	CXL	--	No U.S. registrations.
Watermelon	0.5	CXL	--	U.S. registrants not supporting use.

[1] Based on treatment with acephate.
[2] The MRL is based on residues from the use of methamidophos, not acephate (1996 JMPR).
[3] (*) = At or about the limit of detection.
[4] Including residues resulting from the use of acephate.

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Table D indicates that U.S. tolerances and the Codex MRLs for methamidophos are compatible for Brussels sprouts, cauliflower, celery, head lettuce, and sweet peppers. Incompatibility of the U.S. tolerances and Codex MRLs remain for Chili peppers, cottonseed, potatoes, soybeans, and tomatoes.

DIETARY EXPOSURE ASSESSMENT

Data submitted are sufficient to perform a dietary exposure assessment. Anticipated residue and percent crop treated data were used in the assessment (see memo dated 9/8/99, C. Olinger, D258359). Information used in this assessment are shown in the Table E1 and E2 below.

Table E1. Summary of Anticipated Residues to be Used in Chronic Dietary Assessments [1]

Commodity	Average of Detects, ppm	Weighted Avg of Nondetects, ppm	Weighted Avg, % Crop Treated (%CT)	Percent Imported	Percent Detects	Chronic AR (all Imports Treated) [3]	Chronic AR (Using Registrant %CT for imp) [4]
Potato	0.0098	0.002	21	--	1	0.00044	0.00044
Tomato	0.0376	0.002	32	--	32	0.012	0.012
Cotton	0.04	–[2]	<1	--	--	0.0004	0.0004
Bell Pepper	0.124	0.003	60	20	24	0.0064	0.0062
Non-Bell Pepper	0.124	0.003	60	20	34	0.0088	0.0086
Squash	0.027	0.003	45.7	70.3	3	0.0026	0.0015
Strawberry	0.21	0.003	30	6.5	8	0.0013	0.0011

[1] All anticipated residues are based on FDA or PDP monitoring data with the exception of cotton, where field trial data were used.
[2] Not used as field trial data were used to derive the anticipated residue.
[3] Chronic anticipated residue assuming all imported commodities are treated.
[4] Chronic anticipated residue using registrant value for percent of imported commodities treated.

Table E2. Anticipated Residues for Acute Exposure to Methamidophos from Application of Products Containing Methamidophos as an Active Ingredient

Commodity	Reassessed Tolerance	Percent Crop Treated [1]		Percent Imported [1]	Adjustment Factor for Processing	Data Source for AR	Acute Anticipated Residue, ppm
		Weighted Average	Estimated Max				
Potatoes - RAC - Not Blended	0.1	21	27	--	N/A	PDP	RDF File: Detects: (19 total) 0.038; 0.026; 0.022; 0.015; 0.006 (11x); 0.005 (3x); 0.004 1/2LOD: 359@0.002 Zeroes: 1023@0
Potatoes - Processed Commodities, Partially Blended	None; RAC tolerance applies	21	27	--	1.0	PDP	Use RDF file for Potato RAC
Potatoes - Processed Commodities, Blended (except chips)	None; RAC tolerance applies	21	27	--	1.0	PDP	0.00064
Potato Chips	0.5	21	27	--	10	PDP	0.00064
Tomatoes - RAC and Not Blended processed	2.0	19	27	--	DD[5]	PDP	Decomposite PDP Data
Tomatoes - Processed - Partially Blended - Juice	None; RAC tolerance applies	19	27	–	0.9	PDP	Use RDF file of PDP Data Directly; adding zeroes to represent not treated. Refer to Appendix 1 for RDF file.
Tomatoes - Processed - Partially Blended - Cooked, Canned	None; RAC tolerance applies	19	27	--	0.7	PDP	Use PDP Monitoring data directly; adding zeroes to represent not treated. Refer to Appendix 1 for RDF file.

Commodity	Reassessed Tolerance	Percent Crop Treated [1]		Percent Imported [1]	Adjustment Factor for Processing	Data Source for AR	Acute Anticipated Residue, ppm
		Weighted Average	Estimated Max				
Tomatoes - Processed - Partially Blended - All except Juice and canned	None; RAC tolerance applies	19	27	--	DD[5]	PDP	Use PDP Monitoring data directly; adding zeroes to represent not treated. Refer to Appendix 1 for RDF file.
Tomatoes - Processed - Blended - Catsup	None; RAC tolerance applies	19	27	--	0.9	PDP	Use point estimate of average PDP values = 0.0135
Tomatoes - Processed - Blended - All except Catsup	None; RAC tolerance applies	19	27	--	DD[5]	PDP	Use point estimate of average PDP values = 0.0135
Cotton	0.2	<1	1	--	1.0	FT	0.04
Bell Peppers - Fresh (Imported) - (Not Blended)	TBD	60		20	DD[5]	FDA	Decomposite FDA data
Bell Peppers - Processed (Imported) - (Partially Blended)	TBD[2]	60		20	DD[5]	FDA	Use FDA Monitoring data directly; adding zeroes to represent not treated. Refer to Appendix 2 for RDF file.
Non Bell Peppers -[3] Fresh (Imported) - (Not Blended)	TBD[2]	60		20	DD[5]	FDA	Decomposite FDA data
Non-Bell Peppers - Processed (Imported) - (Partially Blended)	TBD[2]	60		20	DD[5]	FDA	Use FDA Monitoring data directly; adding zeroes to represent not treated. Refer to Appendix 3 for RDF file.
Squash (Imported)	TBD[4]	45.7		70	DD[5]	FDA	Use RDF File of FDA Data Directly: 6@0.005; 0.014, 0.043, 0.087 , 0.057, 0.094; 169@0.003; 374@0

Commodity	Reassessed Tolerance	Percent Crop Treated [1]		Percent Imported [1]	Adjustment Factor for Processing	Data Source for AR	Acute Anticipated Residue, ppm
		Weighted Average	Estimated Max				
Strawberries (Imported)	TBD[4]	30		6.5	DD[5]	FDA	Use RDF file of FDA Data Directly: 9@0.005; 0.053; 0.054; 0.059; 2.5; 34@0.003; 2369@0

1. Percent crop treated are from the Quantitative Usage Analysis dated 11/12/98, T. Kiely. Percent Imported are from a personal communication with T. Kiely, 8/4/99.

2. TBD - To be determined. Existing tolerance is 1.0 to cover domestic use which has been removed from label. Residues of methamidophos are expected from acephate use.

3. Non-Bell peppers includes pimientoes (B. Schneider, personal communication, 7/22/99).

4. TBD = to be determined at the time of the review of the import tolerance petition.

5. DD = DEEM Default. Use DEEM default values when considering the processed products.

AGENCY MEMORANDA RELEVANT TO REREGISTRATION

CB No.:	None
Subject:	Addendum Acephate/Methamidophos Registration Standards.
From:	C. Trichilo
To:	A. Barton/J. Kempter
Dated:	4/4/82
MRID(s):	None

CB No.:	None
Subject:	Methamidophos Registration Standard. Additional Data Requirements
From:	W. Hazel
To:	W. Miller/K. Barbehenn
Dated:	7/25/85
MRID(s):	None

CB No.:	1248
Subject:	3125-280 Methamidophos: Cauliflower and Cotton. Amended Registration
From:	W. Anthony
To:	W. Miller/M. Mautz
Dated:	9/23/85
MRID(s):	None

CB No.:	1350
Subject:	PP#3E3290. Methamidophos on Chinese Radish Roots. Evaluation of Analytical Method and Residue Data.
From:	N. Dodd
To:	H. Jamerson and Toxicology Branch
Dated:	9/25/85
MRID(s):	00145883

CB Nos.:	233 and 234
Subject:	Methamidophos Registration Standard: Addendum #1
From:	C. Trichilo
To:	A. Rispin
Dated:	1/30/86
MRID(s):	None

CB Nos.: 229 and 230
Subject: PP #6F3317/6H5480 Methamidophos on the raw agricultural commodities lentils, melons, milk, peanuts, green peas, dry peas, and soybeans.
From: C. Deyrup
To: W. Miller and Toxicology Branch
Dated: 3/11/86
MRID(s): 00152723, 00152724, 00152725, 0015350, and 00153501

CB No.: 1523
Subject: GA-860004. 24(C) Registration for Methamidophos (Monitor® 4 Spray, EPA Reg. No. 239-2404) on Tomatoes and Eggplant.
From: M. Metzger
To: W. Miller
Dated: 11/10/86
MRID(s): None

CB No.: 1070
Subject: PP#6E3418. Methamidophos (Monitor®) in/on Collards.
From: W. Chin
To: H. Jamerson and Toxicology Branch
Dated: 2/20/87
MRID(s): 00159980

CB Nos.: 2527, 2528, 2730, and 2731
Subject: PP#5F1571/FAP#5H5071: Methamidophos in Cauliflower and Tomatoes - Amendments of May 7 and June 26, 1987 and Amendment of July 24, 1987
From: A. Smith
To: W. Miller and Toxicology Branch
Dated: 3/4/88
MRID(s): 40007401

CB No.: 4709
Subject: ID#3125-341: Methamidophos (Monitor®) in/on Potatoes. Response to Registration Standard, Amendment of 7/14/88.
From: W. Chin
To: W. Miller and Toxicology Branch
Dated: 6/14/89
MRID(s): 40747301

CB No.: None
Subject: Methamidophos DCI: Additional Data Requirements.
From: R. Perfetti
To: R. Engler and L. Rossi
Dated: 1/18/91
MRID(s): None

CB No.: 8107
DP Barcode: D165083
Subject: MD-910009. Methamidophos on Tomatoes. 24(c) Special Local Needs Registration
From: M. Metzger
To: M. Mautz
Dated: 7/22/91
MRID(s): None

CB No.: None
DP Barcode: None
Subject: Reregistration Data-Call-In Requirements for Methamidophos.
From: P. Fenner-Crisp
To: A. Abramson
Dated: 9/9/91
MRID(s): None

CB No.: 8361
DP Barcode: D167301
Subject: MONITOR (Methamidophos). Impact of Craven Analytical Data on Registrations.
From: M. Flood
To: R. Forrest
Dated: 9/27/91
MRID(s): None

CB No.:	None
DP Barcode:	None
Subject:	MONITOR® 4, EPA Reg. No. 3125-280, (Mobay Corporation) and MONITOR® 4 Spray, EPA Reg. No. 59639-56, (Valent U.S.A. Corporation). Impact of Craven Analytical Data on 24(c) Registrations.
From:	M. Flood
To:	R. Forrest/L. Rossi
Dated:	1/24/92
MRID(s):	None

CB No.:	9196
DP Barcode:	D172628
Subject:	Reregistration of Methamidophos. Cottonseed Processing Study.
From:	E. Zager
To:	L. Rossi/R. Richards
Dated:	5/15/92
MRID(s):	41966302

CB No.:	None
DP Barcode:	None
Subject:	Clarification of Residue Data Requirements for Methamidophos
From:	M. Metzger
To:	A. Farrell
Dated:	10/20/94
MRID(s):	None

CB No.:	15088
DP Barcode:	D211934
Subject:	Methamidophos. Confined Field Rotational Crop Study (165-1). Case No. 0043 Chemical No. 101201.
From:	F. Fort
To:	R. Dumas
Dated:	9/5/95
MRID(s):	42758701

CB No.:	17068
DP Barcode:	D224585
Subject:	Methamidophos List A insecticide, Reregistration Case No. 0043. RfD-exceeder project; Anticipated Residues.
From:	D. Hrdy
To:	J. Andreasen and B. Hazel
Dated:	4/16/96

CB No.:	None
DP Barcode:	D227407
Subject:	003125-00280. Protocol Review for Generation of Residue Data in Support of an "Import Tolerance" (Tolerance with No U.S. Registration) for Residues of Methamidophos on Strawberries, Squash, and Peppers Imported from Mexico.
From:	G. Herndon
To:	K. Whitby/M. Mautz
Dated:	7/18/96
MRID(s):	None

CB No.:	None
DP Barcode:	None
Subject:	Acephate Use Closure Memo
From:	L. Rossi
To:	M Stasikowski and J. Merenda
Dated:	12/23/97
MRID(s):	None

CB No.:	None
DP Barcode:	D233457, D235726, and D235728
Subject:	Methamidophos. List A Reregistration Case No. 0043/Chemical ID No. 101201. Nature of the Residue in Plants and Animals, Radiovalidation of Enforcement Method
From:	F. Fort
To:	P. Poli
Dated:	2/2/98
MRID(s):	44209701-44209708

MASTER RECORD IDENTIFICATION NUMBERS

References Used To Support Reregistration

00013677 Morse Laboratories, Incorporated (1976) Chemagro Agricultural Division--Mobay Chemical Corporation Residue Experiment: 462-5746- 75D: Report No. 49920. (Unpublished study including report nos. 49921, 50844 and 50845, received Aug 24, 1978 under 3125-280; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:097318-H)

00014069 Mayberry, T.W.; Sakamoto, S.S.; Leary, J.B.; et al. (1969) Residue Data Sheet: Broccoli. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093264-B)

00014070 Cinereski, J.E.; Leary, J.B.; Sakamoto, S.S.; et al. (1969) Residue Data Sheet: Brussels Sprouts. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093264-I)

00014071 Cinereski, J.E.; Leary, J.B.; Mayberry, T.W.; et al. (1969) Residue Data Sheet: Cabbage. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093264-L)

00014072 Mayberry, T.W.; Sakamoto, S.S.; Leary, J.B.; et al. (1970) Residue Data Sheet: Cauliflower. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093264-R)

00014073 Sakamoto, S.S.; Leary, J.B.; Klaich, M.; et al. (1969) Residue Data Sheet: Lettuce. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093264-W)

00014074 Sakamoto, S.S.; Kalens, K.J.; Witherspoon, B. (1969) Residue Data Sheet: Cotton. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093264-AC)

00014075 Gerber, C.E.; Leary, J.B.; Sakamoto, S.S. (1970) Residue Data Sheet: Potatoes. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093264-AG)

00014077 Chevron Chemical Company (1968) Metabolism of Monitor Insecticide by Plants. (Unpublished study received Mar 5, 1970 under 0F0956; CDL:093264-AO)

00014081 Tutass, H.O. (1968) Uptake and Translocation of Monitor Insecticide by Tomato, Cabbage and Bean Plants. (Unpublished study received Mar 5, 1970 under 0F0956; submitted by Chevron Chemical Co., Richmond, Calif.; CDL:093264-AU)

00014085 Chevron Chemical Company (1968) Monitor Residue Analysis by Thermionic Gas Chromatography. Method RM-10 dated May 31, 1968. (Unpublished study including letter dated Oct 17, 1969 from D.E. Pack to Kenneth J. Kalens, received Mar 5, 1970 under 0F0956; CDL:093264-AY)

00014119 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Culiacan 2: Report No. 37305. Rev. (Unpublished study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-D)

00014120 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Culiacan 1: Report No. 37306. Rev. (Unpublished study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-E)

00014121 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Culiacan 1: Report No. 37307. Rev. (Unpublished study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-F)

00014122 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Los Mochis 1: Report No. 37308. Rev. (Unpublished study published study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-G)

00014123 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Los Mochis 2: Report No. 37309. Rev. (Unpublished study published study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-H)

00014124 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Culiacan 1: Report No. 37310. Rev. (Unpublished study published study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-I)

00014125 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Culiacan 2: Report No. 37311. Rev. (Unpublished study published study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-J)

00014126 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Los Mochis 1: Report No. 37312. Rev. (Unpublished study published study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-K)

00014127 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue

Experiment: Los Mochis 2: Report No. 37313. Rev. (Unpublished study published study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-L)

00014128 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Los Mochis 1: Report No. 37314. Rev. (Unpublished study published study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-M)

00014129 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Los Mochis 2: Report No. 37315. Rev. (Unpublished study published study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-N)

00014130 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Los Mochis 1: Report No. 37316. Rev. (Unpublished study published study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-O)

00014131 Baychem Corporation (1973) Chemagro Division of Baychem Corporation Residue Experiment: Los Mochis 2: Report No. 37317. Rev. (Unpublished study published study received Jul 20, 1973 under 4F1424; submitted by Mobay Chemical Corp., Agricultural Div., Kansas City, Mo.; CDL:093798-P)

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